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THE AWAUG NEWSLETTER

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ADAM WASHINGTON AREA USER'S GROUP

Vol. 7, No. 1 February 1991

In This Issue

We start a series of articles on CP/M on page 4 by Ron Collins. Ron has contributed many informative, well-written articles over the years and this series should enable anyone (even Barry Wilson) to understand CP/M and TDOS. The latest Micro Inovations press release concerning their floppy disk drive is on page 17. From the world of ANN, we have another Guy Cousineau article on SmartBasic on page 13 and chapter 5 of John Terry's series on Fundamentals of Computer Programming on page 21. Tom Barrett has a warning about the 3.5" drives on page 16 and also an important note about dues on page 3. Your editor begs for a few more articles right here in this column. In fact, your editor is so hard up for articles that he even wrote one himself and had the audacity to start the article on page 1. And last, but certainly not least, Barry Wilson has his best article ever on page 23. JM

Revisiting 22DISK
by Jack MacKenn

As a lot of you may know, 22DISK is one of my favorite utility programs. It is an MS-DOS program (and, therefore, doesn't run on our Adams) that performs CP/M to DOS diskette interchange, i.e., you can convert files on diskettes from various CP/M formats to MS-DOS and vice versa. I particularly like it because I use an IBM machine at work to log on the AWAUG BBS. Getting files to and from my Adam to the BBS via an IBM requires conversion software for either the Adam or the IBM. There are programs that will run on the Adam that will perform some conversions but 22DISK running on an IBM (or compatible) is the quickest, easiest and most flexible way to go.

When I got 22DISK about two years ago, the only problem I had was that the only Adam format supported was the standard 160K single sided disks. All of my drives had

been converted to double sided. This was inconvenient (albeit minor) as I had to run JAWS2 or DSKSZxx every time I had something to transfer. I was also limited by the 145K max file size. On rare occasions, there were ARC or LBR files that exceeded 145K requiring me to perform the file transfer from home on my Adam using long distance. Using directions provided in the documentation, I attempted to build a custom definition to support the double sided format. Unfortunately, neither of the double sided ordering options supported by 22DISK was correct for the Adam conversions. I documented those efforts in an article about a year and a half ago. Since then, I've been using 22DISK regularly and wishing for the ability to use a 320K Adam disk on the IBM.

I received the Metro Orlando Adam User Group (MOAUG) newsletter early in January. After a dynamite software review by Bob Blair about an exciting new PD program called AMORTIZE, there was a short paragraph stating that Sydex had upgraded 22DISK to include the Adam double sided formats. Bless you Sydex (and MOAUG)! I immediately called the Sydex BBS and, after a bit of help from their friendly SYSOP, I was able to punch in the right codes and download the upgraded version. Installation was a breeze and I started using 320K disks to bring transfer my files between home and work. It's great!

The latest version (1.34) also supports the Orphanware 3 1/2 inch format and the E&T format is reportedly being worked on. As I don't have a 3 1/2 inch drive (yet), I can't verify its' operation.

22DISK is available for the remarkably low price of $25 from SYDEX, PO BOX 5700, Eugene, OR 97405. It comes complete with thorough documentation. Their phone number is 503-683-6033 (voice) or you can even try their BBS at 503-683-1385. A shareware version is available on their BBS. Frankly, I recommend going right to the registered version. For only $25, it may be the most useful conversion software available.

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AWAUG Treasurer's Report
1990

Starting Balance	$ 1250.00
Incoming Funds	589.16
Expenditures	492.71
Ending Balance	$ 1346.45

/s/Ralph B. Mason
Treasurer

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Hey Folks,
How 'bout them
Super Bowl Winning

GIANTS???!!!

You just knew that somewhere in this newsletter you were going to hear about my Giants. Even though this is a computer newsletter, specifically our beloved Adam, I've been a Giants fan about 30 years longer than I've been an Adam fan. So rejoice with me. BTW, has anybody heard anything about three-peat lately??

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HOW TO JOIN AWAUG

AWAUG membership dues are only $15.00 per year. ADAM users wishing to join AWAUG (and old members renewing their memberships) should make a check or money order out to "AWAUG" and mail it to AWAUG C/O Tom Barrett, 6819 Rosemont Dr., Mclean, VA 22101, or bring to a monthly AWAUG meeting. **Members should note that the date that the member last paid their dues is listed to the right of their name on the mailing labels for AWAUG Newsletters and monthly Meeting Announcements. Please use the information in submitting your membership renewal checks.**

CLUB SERVICES

AWAUG is a non-profit, all volunteer computer user's group dedicated to supporting ADAM owners and the continued availability and advancement of ADAM hardware and software. Members are provided with "hot-line" telephone advice and assistance; this full-service Bulletin Board System; monthly meetings, including meeting announcements mailed to each member; bi-monthly AWAUG Newsletters; club software library (available on tape or disk); blank formatted tapes; and from time to time, special "group-buy" or"group project " prices on hard to find hardware and software items. Watch the Bulletin section, and this message section, for more information on the hardware and software available to AWAUG members.

The above info was provided by our Membership Chairman, Tom Barrett. Please pay particular attention to the info concerning membership renewal. And thanks for your support!

ADVERTISE IN THE AWAUG NEWSLETTER!

The AWAUG newsletter accepts advertising for publication. We believe that advertisements help ADAM owners to know what is available and, therefore, that they are a good service. In keeping with this notion, our rates are very competitive. Because it is to everyone's advantage to encourage enrollment in our club, we offer a discount to members who wish to advertise.

At present, our membership stands at just under 100 ADAM owners, so your advertising will reach a significant number of very interested people. Rates are as follows:

SIZE	Non-member	Member
Full page	$9.50	$6.35
Half page	$6.00	$4.00
Quarter page	$3.00	$2.00
Column inch	$1.00	$ .65

A column inch is 38 characters wide and 5 lines high. For each consecutive column inch, add one line.

Advertising may be for any legal goods or services. Material may be submitted in any intelligible form, from camera ready artwork to telephone orders voice, or by data transmission via the club's BBS, telephone (202) 561-2475.

To make inquiries or place an ad, call or write:

Jack MacKenn (703) 371-7548
415 Camden Drive
Falmouth, VA 22405

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ADAM CP/M 2.2
Part One

INTRODUCTION:

WHAT IS CP/M? I suppose this is a very basic question many who have never used or heard of CP/M might have. As a simple yet accurate answer, let's go to the basics. When you look at your computer, no matter what the brand or design, it's easy to forget that it's really just a glorified calculator. To be sure, there have been a lot of advancements made to it since the days of the abacus, but a device to perform calculations is all that it is.

Now, consider that a "computer" is just a piece of rather sophisticated electronic hardware that can do nothing until it is taught HOW to do it by an operating system (or OS). The program system that tells the ADAM how to "operate" is the well known EOS "The (E)lementary (O)perating (S)ystem" covered in detail by Faye Deere in her articles. EOS is stored on a PROM (programmable read only memory) on the motherboard. CP/M is an alternative to this EOS which runs SmartBASIC, AdamCALC, SmartWriter and much more. CP/M is loaded from disk or tape to tell the ADAM how to run programs other than those available to EOS.

Inside any computer, no matter the make or model, there is a main circuit board called the motherboard and accessory control boards of any quantity. The motherboard contains the microprocessor chip that controls such things as printers, disk drives, etc. The other board or boards contain the devices the microprocessor is going to use to do the work. In the case of the ADAM, the Z80 is the microprocessor (or brain) of the machine. The secondary board is the game board that supplies the color graphics and the sound for our programs. Unlike the normal way of setting up a computer, however, Coleco supplied the Z80 on the secondary or GAME BOARD rather than the motherboard. Their many reasons for this are hardware related though, so I won't bother with the details involved.

The ADAM, just like any other computer, has a great deal of capability wrapped up in that box of electronics hardware! It can perform untold thousands of tasks far quicker than the best of us could do by hand. It can out compute Einstein, out think Newton, track your finances with a degree of accuracy far greater than any accountant and even turn on your TV set! Unfortunately, no computer knows how to do any of these things on its' own. No more than a radio or a television knows what channel you want to watch does a computer know how to carry out its' appointed tasks! You must first tell it what and how.

In the case of a computer, the PROGRAM tells the computer all that it is expected to do. The OPERATING SYSTEM teaches the computer how to these things while the MICROPROCESSOR does the actual work. All three of these things must be in place if that box of wires and chips is to do more than just sit there. There at the top, of course, is YOU telling the program what you want it to do for you.

WHY CP/M? * * STARTING OUT:

It's been a long time since I first became a CP/M user. So much time has passed that writing this article has become a real treat as I take a "trip down memory lane"! Long ago forgotten were the reasons why I ever bought that CP/M 2.2 and Assembler package for my ADAM in the first place! When I think back on all of those many reasons, I realize that I would do the same thing all over again should I have the chance to do so. If you stick with me over the next few paragraphs, I think you'll see why!

I first got into computers because I loved to play games. I guess that's probably what got most folks started if they stop to really think about it. When I bought my ADAM, it was because it would let me play ColecoVision games. It had great color and sound, gave me a built-in word processing program, and it plugged right into my ColecoVision unit! The ADAM could also run programs for countless other tasks like any other REAL computer! It could even be used as an electronic typewriter with true letter quality printing.

My wife (who generally detests computers of any kind or shape) had been after me to buy her an electric typewriter. I compared the costs of various features then available, weighed up the features verses cost information (keeping in mind that I was bound and determined to buy a computer) and finally came up with the only wise decision.... I bought the ADAM! Now to sell it to my wife and live to tell about it (grin).

I showed her the features of SmartWriter and how EASY it was to learn. If she ever forgot anything she could simply look it up on the supplied quick reference card. As she watched me work on a simple letter, moving sentences, moving paragraphs, etc., it only took her minutes to make her decision.... "It's a computer!" she snapped as she walked away, never to even try to use the ADAM until she actually HAD to. Oh well, that left ME with a new toy!

As the months passed and I began to get more familiar with the software Coleco had provided I soon realized that additional new pieces of hardware were needed if I were to continue to use ADAM for productive work. I added memory expanders, disk drives, dot matrix printers, extra data drives and even modems to my now two ADAM systems. I no longer had a "toy" as my "friends" all called it... I had a COMPUTER! In the months that followed, as I worked at that superb keyboard, I fell victim to that "oh-so-much dreaded" computer virus many a long term computer user has been fated to contract: the incurable "more-mores"!

The "more-mores" soon forced me to the point where I wanted all the software I could afford and lay hands on for my ADAM. I watched the sales, I read all the ADAM vendor's catalogs... I haunted the Kiddie City stores for miles around. I bought a lot of games, an auto-dialer and many other programs I wasn't sure I could use. All were the original Coleco software packages to add to my collection. Many were terrific Public Domain game and/or

productivity programs that had never been offered for sale by the folks at Coleco for one reason or another. With all the software I had amassed, I still wanted more! MORE!

One of the programs I had purchased was the CP/M 2.2 program and Assembler package from Digital Research. I put the data pack into the drive and pulled the reset. I was greeted by a pleasing "Welcome to CP/M" screen. There were SmartKeys at the bottom of the screen along with something new: an A>_ Even the SmartKeys were cryptic....DIR, ERA, REN, USER, SAVE, TYPE! What did all of this MEAN? Perhaps I should read the manual? That didn't make a lot of sense to my SmartBASIC oriented brain either! Oh well, on the display shelf it goes! It does, after all, have one nicely done user's manual!

LEARNING THE LIMITS OF EOS:

More months passed as I began to ferret out the power and all of the limitations of standard EOS software. I wanted to use a spreadsheet to maintain a VERY detailed budget using AdamCALC. The program has a wealth of features but the template size is so limited that I could only cover 5 months of my budget at a time! The AdamLINK program couldn't download a file for me over the 300 baud modem. It could capture a message or any other ASCII type file but that was all! SmartFILER wasn't smart enough to use a double sided disk drive for LARGE data-bases and it was slow at sorting even small bits of data. SmartFILER also took up every bit of space on a disk or data pack. The database file was ALL that you could put on the media containing it! I wanted to put a text file on the same disk detailing what was present but there was just no way to do it.

Next, SmartWriter limited me to only a handful of pages before it locked up and my work was lost. The early favorite, SmartBASIC had a small file size limit but a lot of power. It also used non-standard calls so I was unable to use the BASIC files generated on other computers without MASSIVE work to rewrite the pokes and peeks, etc.

Despite all their limits, the many Coleco EOS programs had a lot of built-in-power. If you were willing to restrain yourself to only doing what the software was capable of, you could get an amazing amount of use from your ADAM. The problem with going out beyond those limits was simple: the programs only contained the drivers to utilize printers, disk drives, etc. available at the time they were written. The new hardware just wasn't supported as most of it had never been considered by Coleco engineers who still thought of the ADAM as a TOY! I had also learned, to my chagrin, that much of what I wanted to do was just NOT possible to any known Coleco compatible software.

My program needs were basic to just about any of the fields I wanted to enter. It didn't matter if it were for data-base, spreadsheet or word processing. All the basic fundamental needs were there for all types of software I wanted to run. I needed to be able to go beyond the limit of "what would fit neatly into system memory" That means I wanted to access more of a program

from the disk or data pack when I needed it. With a built-in 64K system memory, use of a program was limited to how big it was. If the program were written in SmartBASIC, you could only use a file of less than 30K! AdamCALC had the same problem.

I also wanted to be able to use the full disk size as my file size limit. Why be stuck with a 30K template or less when the disk still has 120K or more left on it unused? Why can't I use my 64K memory expander for more than just a "print spooler"? Why couldn't I use data files created on other Z80-based computer systems? Why couldn't I DOWNLOAD a program rather than just do a CAPTURE? How could I do a spelling check of my letters? I had a lot of questions that only seemed to have one answer.... another computer was needed!

THE BOTTOM LINE... CP/M TO THE RESCUE!:

Okay, let's put all the cards on the table. I have a rather extensive ADAM system with all of it's new hardware and software. I have a lot of things I want to use it for but can't. I need a new computer to do those things but I just CAN'T AFFORD a new one for any purpose. What's left? It was time to take another long look at what I DID have available. It was time to look one more time at that CP/M 2.2 and Assembler package.

Well, it still looked like something useless. I had those SmartKeys that I still couldn't figure out. It still had that A> and the program just SAT there! I gave it a lot of thought and all things pointed to me sitting down to actually READ the manual that came with the data pack.

LEARNING THE ROPES:

The first thing I learned was that those SmartKey labels DO mean something! I pressed the one labeled DIR first. The screen then read A>DIR _ Since nothing happened, I pressed the RETURN key. A list of file names appeared onscreen in two columns. Now I was starting to get somewhere! The files had a strange naming convention. I saw things like STAT.COM, ASM.COM, ED.COM and many others. What was that .COM for anyway? I also saw a file called HELP. on the list. Well, it worked once so ... HELP <RETURN>. I must have done something wrong because the line dropped down and now it said "HELP?" Okay, time to go back to the manual.

The first few pages gave me a background on the CP/M program and how it was really an alternative Operating System. It seems the ADAM can run more than just one OS. When we use SmartBASIC, AdamCALC, SmartWriter, etc., we are using EOS. This CP/M was an replacement operating system with different capabilities and new ways of using my ADAM. I next learned about those strange new SmartKeys at the bottom of the screen.

The DIR key was set up to print the command DIR when pressed so that you can get the equivalent of SmartBASIC's CATALOG. DIR is the command CP/M looks for to print the directory for you. A space is also printed so that you can enter the drive you want a directory of. CP/M knows about 5 drives useable on our ADAM and

you can get a directory of any of them without ever leaving the drive you are on! This section also explained that A> business for me. I was always used to D1, D2, D4 and D5 in SmartBASIC. I had no problem getting used to SmartFiler's Drive A, Drive B, and so on. CP/M was similar to that type of naming. Drive A was the same as SmartBASIC's D1 (drive one.... or data pack drive one). The first disk drive was called Drive C in SmartFILER. If you are used to the way SmartFILER looks at drives, you are all set!

With CP/M, we are given drive A, B, C, D and M. The thing I had trouble getting used to at first was that CP/M was adaptable to where it was booted from. Unlike SmartBASIC which HAD to be loaded from tape drive 1 to know where the HELLO file was, CP/M could be loaded from ANYWHERE. If you loaded from tape drive 1, that became drive A>. If you booted from tape drive 2, then THAT became drive A>. Everything else just moves down one place and you have access to all of your files. The only drive that stays the same no matter where you boot CP/M from is drive M> This is your memory expander if you have one.

The memory expander (drive M>) is treated by CP/M as a sort of temporary HIGH SPEED disk drive. You can copy files up to it and then run them without ever having to wait for a disk or tape to load. When you turn off your ADAM, these files will go away until you put them back the next time. Any time you want to see the files you've copied up to the memory expander, you can just type DIR M: (don't forget to put in a colon after the drive name) and hit the RETURN. CP/M will even let you specify what type of files you want to look for. If you type DIR *.COM, you will get a list of only the files that end in .COM That gives us a fair rundown on the DIR key.

The second SmartKEY is labeled ERA. This key label is just a shortened form of the word ERASE. The obvious use of this CP/M command is to erase a file. You can ERAse a file from any drive that you have online and logged in. I'll go into logging in a drive and why you would want to do so a bit later. For now, keep in mind that all you have to do to ERAse a file is to hit the ERA SmartKEY (or type in E R A) and follow it with the filename that you want erase. To erase a file by the name of JUNK.COM (just a fictitious name I made up) you would type ERA JUNK.COM and press the RETURN key. It's that easy! Press the DIR SmartKEY and hit the RETURN again to verify if you want. Either way, JUNK.COM is GONE! Be very careful because it's all to easy to ERAse EVERYTHING on the disk or data pack!

The next SmartKEY was REN. This one turns out to be a short from of SmartBASIC's RENAME command. To rename a file is easy once you learn how. In CP/M, you have many different types of files. Files that run without anything else being loaded are all command files. These files are listed in the directory with the file's name (called the FILENAME). This is followed by a period and then the file's type (called the FILETYPE). A program such as COPY (CP/M's program to copy files from one drive to another) would be listed in your directory as: COPY.COM

To change the name of COPY.COM to...say MOVE.COM, you would

use CP/M's built-in REN command. When you look at the directory you don't see a program named REN.COM because the code to rename a file is BUILT-IN to the operating system. Now, there are two ways you can RENname a file. You can either press your SmartKEY or you can type in the simple three letters R E N. Either way, on your screen you will see A>REN _ The underline is just your cursor. This is where the next letter you type will appear.

The REN command works by you telling it exactly what you're wanting it to do. That means you need to tell it what to change in the form: (called the syntax) new FILENAME.FILETYPE equals the old FILENAME.FILETYPE. Okay, that means that RENaming COPY.COM to MOVE.COM would look onscreen as: A>REN MOVE.COM=COPY.COM (then press the RETURN key to do the rename)

The fourth SmartKEY is labeled USER. This is a useful type of command if you know what it means and how to use it. To begin the explanation, let me first look at something we are all very familiar with: SmartBASIC. Under SmartBASIC, if you type CATALOG and press the return, you will be presented with a list of all of the files stored on the current disk or data pack. There are no surprises with your directory if you know how it is set up. BASIC shows 4 types of files A, a, H and h. A catalog will show all of these types because there is no way to keep them separate.

Now, suppose you wanted to place all of your "A" type files on a catalog by itself. How would you do it? Go even further. Suppose you wanted to put your "A" files one place, your "H" files someplace else, your "a" files yet another place and finally your "h" files in yet another catalog area? The only answer is that YOU CAN'T! The EOS system is not designed to keep files segregated in any way. You have only one directory area to work with and no more.

CP/M uses the USER function to allow program organization. If you want to keep all of your different .COM files together, USER will let you do that. CP/M is designed in such a way that it is able to support 16 different places you can store files. At boot-up, you are placed into user area "0". This is your first user area. The 16th area is "15" (remember "0" is your first). I like to keep all of my utility programs on user area 0:, my modem programs in user area 1:, my new files on 2: and so on.

The biggest advantage to program segregation by user areas is that you can keep "like" programs in one place. You can even have 15 files of the same name (such as README.TXT) that are all different files that just happen to have the same name. The way to keep them on the same drive and still be able to use them is to put each one on a different user area. You effectively are in possession of 16 different directory areas!

Logging into a different user area is simple. All you have to do is to press the USER SmartKEY (or just type U S E R) and a number from 0 to 15. To move from USER 0 to USER 15, the command line would appear as: A>USER 15 <cr> (Note, the "<cr>" denotes a carriage return). To get back to user area 0, just type USER 0 and then a <cr>. Moving between user areas is simple. Moving a

file from one user area to another is another matter. I'll talk about moving files from one user area to another at another time.

The fifth SmartKEY is labeled SAVE and it does just what the name would imply. It saves a file stored in memory to the disk or data pack. You won't get much use from the SAVE command until you get into editing programs. DDT.COM, the debugger program on your master CP/M disk or data pack has the ability to load any of the .COM files on your disk, etc. into memory. Once there, you can alter program code any way you like. The changes are only in memory, though, so your main program is safe from any damage.

To create a revised version of a .COM file you have altered, you would use the SAVE command along with a new name onto your disk. You would also need to know how many records you want CP/M to save for you. We won't go into to much detail now on record counts. We'll just see how to use a record count with our SAVE command. Suppose we have just used DDT.COM to edit a program on our disk named TIME.COM. In this case, TIME.COM has 13 records in it. We change some little thing and want to save our version of the program under the name TIME2.COM after we get out of DDT. The command line for this would be SAVE 13 TIME2.COM <cr>.

The sixth and final SmartKey is labeled TYPE. The use of it is just what the name implies... it will type a text file to your screen. Remember that file called HELP. ? If you are interested in what it is, just press the sixth SmartKey, type HELP and then press the return. The command line will look like this:

```
A>TYPE help
```

What you will see on your tv screen or monitor is this:

```
  CP/M 2.2 COMMAND SYNTAX

   DIR [dr:] [file]
   TYPE [dr:] <file to type>
   REN <new> = <old>
   ERA [dr:] <file to erase>
   USER <new user 0 to 15>
   STAT [command line]
   PIP [command line]
   DDT [command line]
   SAVE <pages> [dr:] <file>
   DUMP [dr:] <file to dump>
   ED [dr:] [file to edit]
   LOAD [dr:] <hex file>
   ASM <assembler file> [.param]
   COPY [dr:] <existing file> [dr:] <new file>
   A:[file]
   b:[file]
   FORMAT <CR>
   BACKUP <CR>
   CONFIG <CR>
   SYSGEN <CR>
   ADAM   <CR>
   CPMADAM <CR>
```

As you can see, Digital Research and Coleco wanted you to have a quick reference in case you ever forgot how to use one of the commands or programs they have supplied. It is always a good idea to print this list onto your SmartWriter printer. Keep it in a good location where you can refer to it when needed.

To facilitate easy hard copy of what you are seeing on your TV screen, CP/M has a useful capability built into it. Just as in SmartBASIC, there is a command to turn on the printer and one to turn it off. Rather than trying to remember PR#1 or PR#0 as with the SmartBASIC, you will need to only remember one simple command. CP/M constantly monitors your keyboard as part of it's control over the ADAM. Whenever you type something, CP/M is right there.... watching and waiting to work for you!

Just typing something (anything) will get some sort of response when you press the return. If you type a program name, CP/M will load it for you. Also watched are references to any of the built-in commands imbedded into the operating system. All keyboard access is constantly being monitored so that your every command can be acted upon. In the case of printing to the ADAM SmartWriter printer, simply press the CONTROL and the letter P at the same time. Anything that is typed from this point on will be automaticly echoed to your printer and typed out on paper. To cancel this printing, just use that same CONTROL P combination again. Everything that you type and everything that CP/M tries to tell you will be printed until this option is cancelled.

To get a hard copy of this HELP file, simply type CONTROL P (which would show up as ^P on your screen) followed by your command of TYPE HELP <return>. It is easy to see that this is a very efficient operating system. There are many more commands built into CP/M. Thousands of useful software packages have been written commercially for use under CP/M to give you even greater flexibility. Many of these programs have been released to the Public Domain or as Shareware.

MORE THAN MEETS THE EYE:

As I began to study that CP/M 2.2 user's guide, I began to learn some new concepts. These were ideas always missed in things like SmartBASIC but no so clearly that you could put your finger on it until you saw how it "could have been". A perfect example of this is the CATALOG function of SmartBASIC. Have you ever wanted to boot a program ... let's call it HELLO, and failed to spell it correctly? Perhaps you typed run hello <return>. As we all know, SmartBASIC doesn't care if you type "run" or if you type "RUN"... it all means the same to it. Why then doesn't it know that "hello" is the same as "HELLO"?

The reason is obvious to even a casual SmartBASIC user. You are able to store a wide variety of DIFFERENT programs of the same name if you spell it different. You could name it "hEllo" or "heLLo" or any other combination. SmartBASIC sees them all as different programs. Now, suppose you wanted to see the all of the various spellings of the word hello in your catalog. How do

you go about this in BASIC? You don't!

CP/M looks at every command no matter what case they are in when you type them as upper case. If you type in lower case, CPM will translate it to upper case every time. The result is that a file name can only exist in one form, upper case, at one time. A program called HELLO could only be present once. If you tried to save a new program to the same disk and user area called hEllo, a function of CP/M would delete the original and place your new file in the same location!

You could have multiple files called HELLO only by changing the second part of a CP/M filename. The filename always has two parts to it. The first part is the one we called HELLO...this is the filename. The second part is known as the filetype. There is always a period present to separate the two parts for you. A few of the conventions of the name are that the filename can have any number of letters or numbers from 1 to 8. The filetype can have up to only 3 characters in it.

To use multiple files by the name HELLO then, you could alter the filetype of the various differing files. You could use HELLO.BAS, HELLO.TXT and even a HELLO.SB1. CP/M will also look at the filetype and consider the three files different. Now, say we wanted to try that search of the DIR (CP/M's CATALOG) to look for all the various HELLO program files we have on the disk. Let CP/M do the work for you!

One of the more useful features of CP/M is its' ability to recognize what we call wildcard characters. The manual refers to a command such as DIR CAT.COM (which will list the presence of a file called CAT.COM on the current drive/user if it is present) as an UNAMBIGUOUS command. What that means is that you have been very clear in telling CP/M exactly what you want it to look for.

Wildcard characters can also be used. These characters are either the "?" or the "*" characters. If you use the "?", it is only going to represent one letter or number in the filename or filetype. For each character in the name, you must use a separate "?" character. The "*" is used to represent a group of characters. Because these are used in a more general way, they are considered to be AMBIGUOUS commands.

To use these wildcard characters in an example, let's look for that program we mentioned earlier. We could always type the command DIR CAT.COM. We could also type DIR C??.COM which would also show up files like CAR.COM, CRT.COM, CLS.COM, etc. I tend to not use the "?" key, however. I don't like to type any more letters than I absolutely have to. The "*" is the one character I use to save my fingers. If I type DIR C*.*, I will be given all the files listed above plus things like CATERWAUL.DOC, etc. In short, it will list ALL files and ALL filetypes which have the one thing in common... a letter "C" as the first character.

I could also mix them up. DIR C??.* would only list the "C" files with three letters in their name and any filetype. I could even do things like DIR *.COM or DIR *.BAS or even DIR *.C?M. If

you take a few minutes to think about this, I'm sure you'll find a few ideas of how this could be a useful tool.

CP/M as an operating system is very sophisticated, yet it's also very simple. It will only do for you what you ask it to do specificly. It's built-in commands and many thousands of useful utility programs make up quite a "tool box" for the serious or casual users. I'll cover some of those useful utilities in the next part of the article so that you can begin to get some use out of that program you still have sitting on the shelf. In the meantime, please look at the manual. Please experiment a bit with some of these simple tricks until you get a feel for them.

I know it will take time to get comfortable with CP/M but it was that way for me with every program ever purchased for my ADAM from the very beginning. CP/M actually has less to remember as it does much of the memory work for you. Until next time, keep plugging away!

Ron Collins

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EXPLORING SMARTBASIC
BY GUY COUSINEAU

MISCELLANEOUS COMMANDS

This article covers a few elementary commands which don't fit in any other category. This will be the last series before we start the really big stuff.

When you work with arrays (matrices), you must define the size of your array via a DIM statement. Note that small linear arrays (up to 10) do not need a DIM statement. You can freely use variables x(0) up to x(9). Yes ZERO is a valid array definition and should be kept in mind when defining large arrays. Say you want to create a 4 by 13 matrix for storing a deck of cards:

```
10 DIM c(4,13)
```

works but actually creates an array of 5 by 14 (0 to 4 inclusive by 0 to 13 inclusive. The number of array elements is 70 instead of the 52 required. So what? You are using 35% more memory than you really need. A few large arrays combined with a large program can quickly eat up all your RAM space.

This is a good time to introduce INTEGER variables. Ever see a program with lines like c%=a%+2*e%? The PERCENTAGE sign tells SmartBASIC that your numbers are signed integers in the range of -(2^15) to 2^15. When these variables are stored in memory, each takes 2 bytes compared to a floating point number which takes 5 bytes. Consider the amount of memory required by the following arrays:

ARRAY	HEADER	RAM	TOTAL	DIFFERENCE
DIM a(4,13)	5	350	355	0%
DIM a(3,12)	5	260	265	75%
DIM a%(4,13)	5	140	145	40%
DIM a%(3,12)	5	104	109	30%

Not all numbers can be defined as INTEGER variables. DEF, and FOR require a real variable (floating point) because of the nature of their execution. You can, however change an integer variable into a real one with:

```
a=a%    (both a and a% are different variables)
```

You can define several arrays on the same line if they are separated with commas:

```
DIM a(23),b(2,12),c(550,d(2,3,8).
```

DEF is used to define a function. Unless your functions are complicated, this is not a recommended approach to programming since it makes program logic hard to follow. Let's take a simple example:

```
10 DEF FN cost(amount)=amount*unitcost
20 unitcost=2.34
30 INPUT "Amount to buy ";amount
40 PRINT "Your cost is $";FN cost(amount)
50 GOTO 30
```

This program starts by defining a function which takes the parameter supplied in brackets (amount) and multiplies it by a fixed variable "UNITCOST". Line 40 could have been replaced with:

```
40 PRINT "Your cost is $";amount*unitcost
```

So why use FN? Say you want to deal out random numbers of a varying range and you want your random numbers to be integer values starting at 1. You might get fed up of typing:

INT(rnd(1)*10)+1 and occasionally forget a bracket and get a syntax error:

```
10 DEF FN ran(range)=int(rnd(1)*range)+1
20 INPUT "Range ";r
30 PRINT FN ran(range)
40 GOTO 20
```

REM statements are very useful for beginners and even for advanced programmers who want to distribute copies of their programs. A REM statement can be used to describe what a subroutine does or the purpose of a particular program segment. They can also be used to tag program areas where potential bugs exist to remind you where you need to do extra work. One important thing to remember. DO NOT 'GOTO' a REM statement!!! At some point in time you may remove some extraneous REM statements and crash your program with an UNDEFINED STATEMENT error. If you

have a subroutine at 1000, insert your REM statement at line 999 to describe what it does. You will often see programs which start out with several REM statements to describe a program, or issue a copyright notice.

LIST is used obviously to list out part of your program on the screen (or printer if PR#1 has been used). It has a somewhat loose syntax:

```
LIST            list everything
LIST 100,200    list from 100 to 200 inclusive
LIST 100-200    as above
LIST 100-       list from 100 to the end
LIST -200       list everything up to 200
```

To pause a long list, you can use CONTROL-S. You can resume the list with any key press even CONTROL-S. It is easier for clumsy typists to tape the CONTROL-S several times in succession to start and stop the list. Note also that LIST can be used within a program....think of a use for it.

DEL is used to delete a line number or a range of line numbers; it uses the same syntax as LIST. Do not confuse it with DELETE which is used to delete a file from tape/disk. DELETE can also be used within a program. Consider the following situation:

```
10 PRINT "Please wait"
20 LOMEM:30000
30 PRINT CHR$(4);"BLOAD data"
60 PRINT"Program Ready"
```

This program starts by loading some data from file and then proceeds to execution. What if the program crashes and you have to type RUN to start again? You will have to wait those several extra seconds while the data loads back in again. Why not add a few more lines:

```
40 DEL 30
50 REM line 30 is PRINT CHR$(4);"BLOAD data"
```

That way, if the program crashes, you can re-enter quickly with RUN. If it crashes badly enough that you need to reload the data, you can check out the name of the data file with LIST 50. If you use this technique, be sure that line 30 is really there before you save program changes.

You don't need to use DEL to delete one or 2 lines, just type the line number to delete and follow with RETURN. As a matter of fact, this approach is safer since it deletes only one line at a time.

The DIM execution starts at 6942 (1B1E). It checks for double-defined variables, and makes sure that there is enough free space for both the pointer table and the data. If the DIM array is anything but a string array, that RAM area is blocked off so it can't be overwritten. STRING arrays are not blocked off since we can't predict the length of strings.

The parser for DEF starts at 15125 (3B15). It checks that the word 'FN' follows the DEF statement and that 'FN' is also followed by a space...the syntax is critical here. You can change the 'FN' word to any 2 characters by POKEing them into 15152 (3B30). It then continues with another parser which gets an equation in REAL variables (not integer). DEF executes at 8244 (2034). It goes through some interesting gymnastics to find the '(' and extract the number or variable from the brackets, skips the ')', and aborts if anything appears to be wrong. Then the address of the DEF FN routine is passed to the program controller which takes over as soon as the rest of the line is read in (and ignored.)

LIST executes at 7407 (1CEF). It jumps around checking for the variety of command forms and lists lines one at a time while checking for CONTROL-S or CONTROL-C.

DEL executes at 7555 (1D83). It jumps around doing the same thing as LIST (in a different way) and proceeds to delete the specified lines issuing error messages if not found.

Next time out, reading the joysticks.

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ANN EDITOR'S NOTE.
The foregoing was another in the series of articles by Guy Cousineau of AUFG, and was again provided to ANN by Ron Mitchell, President of AUFG.

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FILE PROBLEMS WITH 3.5" DRIVES

The following problem was reported by Tom Barrett. In his words, "I have run into a rather serious problem when using the Adam 3.5 inch disk drive and the standard Adam 5.25 disk drive that has files on it. The data from the 3.5 drive will overwrite the files already on the disk. Also, if you have booted the 3.5 system into memory and then copy the files from memory onto the 5.25 disk, the files already on the disk will be destroyed. However, this problem can be avoided if you use freshly formatted 5.25 disks for your 3.5 data.

"The problem is caused by the difference in structure between the standard Adam system and the 3.5 drive. The Adam system structure uses 8 sectors per group while the 3.5 system uses 16 sectors per group. This means that twice the data is transferred at a time. Also, the 3.5 system will retain its' structure regardless of where you put its' files. However, you can safely copy 3.5 system files to an Adam 5.25 disk if you do not have any standard Adam structured files on it."

This problem has also been noted by Tom Keene of IEAUG who has written extensively about it. JM

Micro Innovations
12503 King's Lake Drive
Reston, Virginia 22091
(703) 620-1372

ADAMnet Floppy Disk Drive Press Release
January 1, 1991

Micro Innovations is pleased to introduce another new line of enhancement products for the Coleco ADAM computer - the ADAMnet floppy disk drives. Delivery is scheduled to begin in early February of 1991. The line contains two basic models: a 320 KiloByte 5.25 inch unit and a 720 KiloByte 3.5 inch unit. Several variations of each model will be available.

The drives come complete with external power cube and connecting cable and are ready to plug in and operate. The power cube plugs in to the back of the drive and uses standard 120 volt AC house current. The connecting cable is a 6 wire telephone cable and allows the drive to be plugged directly into the ADAMnet connector on the side of the ADAM or into another floppy disk drive's "ADAMnet Output" connector. The drive does have an ADAMnet output connector to allow a second ADAMnet drive to be plugged into it.

No software is provided with the drive as it is totally compatible with the Coleco drive. However, public domain software, including TDOS, is available from the Micro Innovations Bulletin Board System, at (703) 264-3908, for those who want or need it. The Micro Innovations BBS operates from 6:30 PM to 6:30 AM, Monday through Friday, and 24 hours a day on weekends and holidays. Please do not call the BBS number during the day (8:00 AM through 5:00 PM) during the work week as the BBS will not be up and the line is used for another purpose during that time.

The two drive models are available in several variations. Unless specified differently at the time of order, the 320KB 5.25" drives will be shipped with a standard 320KB Double-Sided Double-Density PROM. This drive can read 160KB, 254KB, and 320KB formats. The unit can also be delivered with a 360K IBM-compatible format, if desired. Although this version stores more data than the standard 320K version, it cannot read or write the ADAM formats. The standard 720KB 3.5" drives will be shipped with an E&T Software compatible PROM installed. This model can also be delivered with an Orphanware compatible PROM, if desired. There is no extra charge for the substitution of an alternate PROM, as long as it is identified at the time the order is placed.

Introductory pricing is set at $199.00 for the 320KB unit and $249.00 for the 720KB unit. The drives are available directly from Micro Innovations or from the following dealers: Adam's House, Route 2 Box 2756, Pearland, Texas 77581 - (713) 482-5040; NIAD, 6460 College Road, Lisle, Illinois 60532 - (312) 961-3529; Adam Link of Utah, 2337 South 600 East, Salt Lake City, Utah 84106; and The Adam Connection, P.O. Box 562, Champlain, New York 12919 - (518) 298-8193. Other dealers are expected to be added to the list. Please check with your favorite Adam dealer to see if he or she carries the drives. If your dealer does not carry the drives, please have him or her contact Micro Innovations to sign up as a dealer. Micro Innovations is open for business from 6:30 PM through 9:30 PM, Monday through Friday. An answering machine takes messages at all other times. The Micro Innovations voice line also has a FAX machine connected to it. Orders can be placed by voice during the normal office hours or by leaving a message on the answering machine or by FAX or BBS message at other times.

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Micro Innovations
12503 King's Lake Drive
Reston, Virginia 22091
(703) 620-1372

Product Price List - 1/1/91

Powermate XT and AT Computers

Powermate XT:

Complete 12 MHz IBM PC/XT compatible computer with 640KB of main memory, one RS-232 serial port, one parallel printer port, one game controller port, clock/calendar, 360 KB floppy disk drive, 101 key keyboard, monochrome graphics board and monitor, and fast RLL hard disk controller with 15, 32, or 65 MB hard disk.

Powermate AT:

Complete 12 MHz IBM PC/AT compatible computer with 1 MB of main memory, one RS-232 serial port, one parallel printer port, one game controller port, clock/calendar, 1.2 MB floppy disk drive, 101 key keyboard, monochrome graphics board and monitor, and fast 1:1 interleave RLL hard disk controller with 15, 32, or 65 MB hard disk. Exhibits Landmark speed measurement of 16 Mhz and Norton version 4.5 computing index rating of 13.4.

Custom 80386SX, 80386, and 80486 systems are also available upon request. Call for quote.

Powermate XT/AT Base Units:	List Price
Powermate XT/15	$699.00
Powermate XT/32	$799.00
Powermate XT/65	$899.00
Powermate AT/15	$899.00
Powermate AT/32	$999.00
Powermate AT/65	$1099.00

Powermate XT/AT Options:

Second Floppy Disk Drives:	
360KB or 720KB	$100.00
1.2MB or 1.4MB	$150.00

Second Hard Disk Drives:	
15 MB Drive	$150.00
32 MB Drive	$225.00
65 MB Drive	$300.00

Video Upgrades:	
8/16 bit VGA board w/256K, upgradeable to 512KB (800 X 600 with 256KB)	$100.00
8/16 bit VGA board with 512K memory (1024 X 768 resolution)	$150.00
256KB to 512KB memory upgrade kit	$50.00

Cables:	
IBM Serial (6 feet)	$14.95
IBM Parallel (6 feet)	$14.95

Powermate Floppy/Hard Disk Subsystems

Standalone add-on subsystems that provide one or two 10, 20, or 40 MB hard disk drives, one or two 360K or 720K floppy disk drives, two RS-232 serial ports, a parallel printer port, and a memory expander board port for the Coleco Adam computer.

Base Units:	List Price
Powermate 10	$399.00
Powermate 20	$499.00
Powermate 40	$599.00

Options:

Floppy disk drive (specify 360KB or 720KB)	$100.00

Second Hard Disk Drive:

10 MB Drive	$150.00
20 MB Drive	$225.00
40 MB Drive	$300.00
Peripheral Cable (Serial or Parallel)	$14.95

ADAMnet Floppy Disk Drives

Stand-alone floppy disk drives for the Adam Computer. Plugs in to ADAMnet. Comes with external power cube and ADAMnet cable. Available with several different PROMs. Standard PROMs are: 320K Double-Sided format for the 5 1/4" drive and 720K E&T Software format for the 3 1/2" drive. Other formats available are: 160K Single-Sided and 360K IBM format for the 5 1/4" drives and 720K Orphanware format for the 3 1/2" drives.

360 KB 5 1/4" unit	$199.00
720 KB 3 1/2" unit	$249.00

Multi-Purpose Interface Board

Plug-in board that adds two RS-232 serial ports, a parallel printer port, and a memory expander board bank switching port to the Coleco Adam computer. MIB2 I/O ports are compatible with Powermate I/O ports.

Product	List Price
MIB2 Interface Board	$74.95
Peripheral Cable (Serial or Parallel)	$14.95

Notes: Peripheral cables for the Powermate and MIB2 serial and parallel ports are not included with those units. The disk cable is included with Powermate units. ADAMnet cables are supplied with the ADAMnet floppy disk drives.

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The following article is the fifth chapter of a beginner's programming manual by John Y. Terry, Sr., former president and present treasurer of Metro Orlando ADAM User's Group. It first appeared in the September, 1990 MOAUG newsletter.

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FUNDAMENTALS OF COMPUTER PROGRAMMING
by John Y. Terry, Sr. MOAUG

Chapter 5: Data Manipulation

The data manipulation section is the part of the program where the arithmetic and most logical operations occur. Moving data from one place to another is also accomplished here.

If a sequence of instructions is to be used more than once, it is best to put that sequence in a subroutine. This will save programming time and reduce errors.

Keep mathematical equation as simple as possible. Remarks will help to identify what is occurring and why.

Use linear programming (one instruction per programming line) as much as possible in this section as linear programming is easier to debug or change later.

Most of the programming errors will occur in this section of the program. It cannot be overemphasized that simplicity is the key to good, and easily understood, programming.

Be sure to use the instructions of the programming language properly and understand what an instruction is doing. Don't depend on what you think should be happening; be sure.

Insure that you understand the way the programming language acts on a methematical equation, and use the instructions accordingly.

Be sure that the elements of the equation are properly expressed and in the proper order for the programming language to operate on the equation properly.

Insure that the returns from the subroutine are at the proper instruction line. Most computer programming languages will return from a subroutine to the instruction following the instruction to branch to the subroutine. Be sure you understand what your particular computer is doing and why it is doing it the way that it is.

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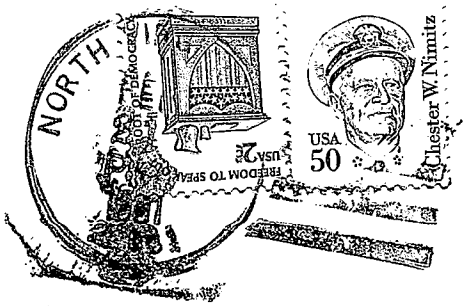
Next month: Chapter 6 -- SUBROUTINES

The Fine Print



AWAUG
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